



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,406	11/19/2003	Charles Q. Zhan	120 06741US	7240
128	7590	10/17/2005	EXAMINER	
HONEYWELL INTERNATIONAL INC. 101 COLUMBIA ROAD P O BOX 2245 MORRISTOWN, NJ 07962-2245			LE, TOAN M	
			ART UNIT	PAPER NUMBER
			2863	

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

Office Action Summary	Application No. 10/717,406	Applicant(s) ZHAN ET AL.	
	Examiner Toan M. Le	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 and 22 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 5, 7-9, 11, 14-16 and 18 is/are rejected.
- 7) ☒ Claim(s) 3, 6, 10, 12, 13, 17, 19 and 20 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>5/5/05</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-2, 4-5, 7-9, 11, 14-16, and 18 are rejected under 35 U.S.C. 102(a) as being anticipated by “Applying MultiResolution Analysis for Processing of Hydraulic Pump Fault Signal”, Wanlu et al. (referred hereafter Wanlu et al.).

Referring to claims 1, 8, and 15, Wanlu et al. disclose a method; apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code (Abstract); comprising:

decomposing a signal comprising a plurality of process variable measurements into a plurality of resolution levels, the process variable measurements associated with operation of a valve (Abstract; page 2, 2nd col., lines 19-37; equations 11-17; figure 1);

grouping the resolution levels into a plurality of groups (Abstract; page 2, 2nd col., lines 19-37; equations 11-17); and

identifying one or more defect indicators for at least some of the resolution levels using the groups, the one or more defect indicators associated with a possible defect in the valve (Abstract; page 4, 1st col., 2nd paragraph and last paragraph to page 4, 2nd col., 1st and last paragraphs; figure 2).

Art Unit: 2863

As to claims 2, 9, and 16, Wanlu et al. disclose a method; apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code, wherein:

decomposing the signal comprises performing wavelet decomposition to generate wavelet coefficients at each of the resolution levels (page 2, 2nd col., lines 19-37; page 3, 2nd col., last paragraph; table 1);

grouping the resolution levels comprises grouping the wavelet coefficients into groups (page 2, 2nd col., lines 19-37; equations 11-17); and

identifying the one or more defect indicators comprises performing singularity detection using the groups of wavelet coefficients (page 4, 1st col., 2nd paragraph and last paragraph to page 4, 2nd col., 1st and last paragraphs; figure 2).

Referring to claims 4, 11, and 18, Wanlu et al. disclose a method; apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code, wherein the one or more defect indicators identify one or more jumps in the process variable measurements (page 4, 2nd col., last paragraph; figure 2).

As to claim 5, Wanlu et al. disclose a method, wherein the one or more jumps represent one or more deterministic signal changes where the process variable measurements change by a threshold amount within a given time period (page 4, 2nd col., last paragraph; figure 2).

Referring to claims 7 and 14, Wanlu et al. disclose a method; apparatus; a computer program embodied on a computer readable medium and operable to be executed by a processor, the computer program comprising computer readable program code, wherein grouping the

Art Unit: 2863

resolution levels into the plurality of groups comprises grouping the adjacent three resolution levels into groups, the groups forming overlapping groups where at least some of the resolution levels form part of two or more groups (page 2, 2nd col., lines 19-37; equations 11-17; page 4, 2nd col., 1st paragraph; figure 2).

Claims 3, 6, 10, 12-13, 17, 19-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The reason for allowance of the claims 3, 6, 10, 12-13, 17, 19-20 is the inclusion of steps of determining a probability of a valve defect based on the selected resolution level from measurements of a flow rate through the valve and generating a second signal for a valve adjuster.

Wanlu et al. neither teach nor suggest those limitations.

Allowable Subject Matter

Claims 21-22 are allowed.

The reason for allowance for the claims 21-22 is the inclusion of a controller operable to generate output values for adjusting the valve based on the process variable measurements associated with the operation of the valve.

Wanlu et al. neither teach nor suggest this feature.

Remarks:

Response to Arguments

Applicant's arguments filed 8/8/05 have been fully considered but they are not persuasive.

Referring to claims 1, 8, and 15, Applicant argues that “However, the cited portions of Wanlu do not anticipate decomposing a signal into a ‘plurality of resolution levels’, grouping the ‘plurality of resolution levels’ into a ‘plurality of groups,’ and identifying ‘one or more defect indicators... using the [plurality of] groups as recited in Claims 1, 8, and 15. The first portion of Wanlu simply recites various ‘decomposition formulas.’ In other words, this portion of Wanlu identifies the formulas that are used to decompose a signal into multiple decomposition layers. These formulas have absolutely nothing to do with grouping ‘resolution levels’ into multiple ‘groups’ and then identifying one or more defect indicators ‘using the groups’ as recited in Claims 1, 8, and 15.”

Wanlu discloses “The time-frequency localization features of the wavelet transform and the signal wavelet decomposition-reconstruction algorithms based on the multi-resolution analysis are studied. According to the propagation features of the modulus maximums of the fault signal and the noise under the wavelet transform different on the scales, and by use of the signal wavelet decomposition-reconstruction algorithm, the pump shell vibration acceleration signal is decomposed, noise eliminated, and reconstructed. The fault characteristic signal on time domain is located. The fault characteristic frequency is extracted.” (Abstract)

Wanlu discloses “According to the multi-resolution analysis [4], there is a set of recurrence decomposition formulas for the signal $f(t)$ as follows, equations 11-17. Where $A_j f(t)$ is the low-frequency approximation of $f(t) \in L^2(R)$ on the scale 2^j . $D_j f(t)$ is the high-frequency detail of $f(t) \in L^2(R)$ on the scale 2^j . The coefficient sequence $\{h_n; n \in Z\}$ is the low-pass filter coefficients corresponding to the scaling function $\phi(t)$. The coefficient sequence $\{g_n; n \in Z\}$ is the high-pass filter coefficients corresponding to the wavelet function $\psi(t)$. The two coefficient

Art Unit: 2863

sequences constitute the orthogonal conjugate filters.” on page 2, 2nd col., lines 19-37. And “The characteristic frequency of the shoe-loosing fault is equal to the rotational frequency. When we conduct the threshold noise elimination to d1d2d3, the frequency band of the noise elimination is 0.625~5kHz, the ultra-harmonics of the fault characteristic signal loses a little.” on page 4, 1st col., 2nd paragraph.

Thus, Wanlu does disclose decomposing a signal into a ‘plurality of resolution levels’, grouping the ‘plurality of resolution levels’ into a ‘plurality of groups,’ and identifying ‘one or more defect indicators... using the [plurality of] groups as recited in Claims 1, 8, and 15.

Conclusion

THIS ACTION IS MADE FINAL.

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toan M Le whose telephone number is (571) 272-2276. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:30 P.M..

Art Unit: 2863

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Toan Le

October 7, 2005



MICHAEL NGHIEM
PRIMARY EXAMINER